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# STATE INCOME TAX AMNESTIES: CAUSES\*

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This paper analyzes empirically for the years 1980–1988 the factors that led states with state income taxes to run tax amnesty programs. We find that the potential yield from an amnesty is more important than the fiscal status of a state. Furthermore, we estimate that if the IRS audit rate had remained constant during the 1980–1988 period (instead of falling by almost one half), then the cumulative probability that an average state would have had a tax amnesty by 1988 would have fallen by just over 25 percent.

## I. INTRODUCTION

Between December 1981 and March 31, 1990, 28 states with state income taxes offered some form of tax amnesty program that included income taxes.<sup>1</sup> Two states (Illinois and Louisiana) have each conducted two tax amnesty programs. The dates for state tax amnesty programs that have included income taxes,<sup>2</sup> their gross revenues, and coverage characteristics are shown in Table I.

Gross revenues from state tax amnesty programs have ranged from lows of \$150,000 and \$280,000 for North Dakota and Louisiana, respectively, to highs of \$182 million and \$401 million for New Jersey and New York, respectively. All of the programs included nonfilers but varied with respect to whether taxpayers with delinquent accounts or taxpayers who filed returns but underreported their taxes were eligible. The earliest five state tax amnesty programs covered nonfilers only.

Despite the fact that 28 of the 40 states with nontrivial state income taxes have now run tax amnesty programs, the efficacy of

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1. Alaska, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming have no state income tax. Connecticut taxes only interest, dividends, and capital gains, while Tennessee and New Hampshire tax only interest and dividends.

2. Texas and Florida also have run tax amnesty programs, but these states do not have income taxes.

TABLE I  
HISTORY OF STATE TAX AMNESTIES, REVENUES, AND COVERAGE

State	Time period	Gross revenue (\$ millions)	Coverage		
			Non-filers	Accounts receivable <sup>a</sup>	Under-reporters <sup>b</sup>
Illinois (# 1)	12-28-81 to 1-08-82	0.089	yes	no	no
Arizona	11-22-82 to 1-20-83	6.0	yes	no	no
Idaho	5-20-83 to 8-30-83	0.3	yes	no	no
Missouri	9-1-83 to 10-31-83	0.9	yes	no	no
North Dakota	9-01-83 to 11-30-83	0.2	yes	no	yes <sup>c</sup>
Massachusetts	10-17-83 to 1-17-84	86.5	yes	yes	yes
Alabama	1-20-84 to 4-1-84	3.1	yes	no	yes
Kansas	7-01-84 to 9-30-84	0.6	yes	no	no
Oklahoma	7-01-84 to 12-31-84	13.9	yes	yes	yes
Minnesota	8-01-84 to 10-31-84	11.7	yes	yes	no
Illinois (# 2)	10-1-84 to 11-30-84	160.5	yes	yes	yes
California	12-10-84 to 3-15-85	198.0	yes	yes	yes
New Mexico	8-15-85 to 11-13-85	13.7	yes	no	yes <sup>d</sup>
South Carolina	9-1-85 to 11-30-85	7.5	yes	yes	yes
Wisconsin	9-15-85 to 11-22-85	26.8	yes	yes	yes
Colorado	9-16-85 to 11-15-85	6.4	yes	no	yes
Louisiana (# 1)	10-1-85 to 12-31-85	1.2	yes	no	no
New York	11-01-85 to 1-31-86	401.3	yes	yes	yes
Michigan	5-12-86 to 6-30-86	109.8	yes	yes	yes
Mississippi	9-1-86 to 11-30-86	1.0	yes	no	yes
Iowa	9-02-86 to 10-31-86	35.1	yes	yes	yes
West Virginia	10-01-86 to 12-31-86	15.9	yes	yes	yes

TABLE I  
(CONTINUED)

State	Time period	Gross revenue (\$ millions)	Coverage		
			Non-filers	Accounts receivable <sup>a</sup>	Under-reporters <sup>b</sup>
Rhode Island	10-15-86 to 1-12-86	0.7	yes	no	no
Arkansas	9-01-87 to 11-30-87	1.7	yes	no	yes
Maryland	9-01-87 to 11-02-87	34.5	yes	yes	yes
New Jersey	9-10-87 to 12-08-87	186.5	yes	yes	yes
Louisiana (# 2)	10-01-87 to 12-15-87	1.2	yes	no	no
Kentucky	9-15-88 to 12-15-88	61.1	yes	no	yes
North Carolina	9-1-89 to 12-01-89	37.6	yes	yes	yes
Virginia	02-01-90 to 03-31-90	32.2	yes	yes	yes

a. Amnesty waives penalties for payment of delinquent accounts.

b. Amnesty includes individuals who filed returns but underreported their tax liability.

c. The North Dakota tax amnesty was only open to persons not "under investigation." In principle, underreports were included, but only nonfilers participated.

d. Approximately 95 percent of gross revenue from the New Mexico tax amnesty came from nonfilers.

Source: Federation of Tax Administrators.

such programs remains uncertain. Controversy also surrounds proposals for a federal income tax amnesty [Leonard and Zeckhauser, 1987]. One reason for these controversies is that almost no systematic empirical work has been done on the factors that have caused states to run tax amnesty programs, the reasons why taxpayers participate in them, and the future effects of the programs on the number of returns filed and on total revenue collected. Some evidence does exist on those aspects of state tax amnesty programs that tend to affect gross amnesty revenues. Alm and Beck's [1986] analysis of amnesties for the calendar years 1982–1985 identifies two features as important: the participation of known delinquents, i.e., the inclusion of accounts receivable, and the coupling of increased enforcement efforts with the amnesty program.

The purpose of this paper is to analyze empirically for calendar and fiscal years 1980–1988 the factors that led states with state

income taxes to run tax amnesty programs.<sup>3</sup> We find a principal factor to be the level of IRS auditing; in particular, we find that states have tended to “free-ride” on the IRS. That is, if the IRS is active in a state, then that state is less likely to run a tax amnesty program. Our estimates indicate that if the IRS audit rate had remained constant during the 1980–1988 period (instead of falling by almost one half), then the cumulative probability that an average state would have had a tax amnesty by 1988 would have fallen by just over 25 percent compared with its actual level.

In Section II we review the relevant literature, concentrating on the characteristics of state tax amnesty participants and the perceived benefits of state tax amnesties to states. We next develop a discrete-time duration model of amnesties in Section III. In Section IV, drawing upon the discussion in Section II, we specify and estimate our duration model, and in Section V we discuss the results obtained from it. We conclude in Section VI with some brief speculations on the policy implications of our results.

## II. THE OBJECTIVES OF AMNESTIES AND CHARACTERISTICS OF AMNESTY PARTICIPANTS

In the most comprehensive published review of state tax amnesty programs, Ross [1986] reports that “[m]ost state officials said that the primary goals of . . . amnesty programs were prospective: to get taxpayers back on the tax rolls, and to improve future compliance,” the latter in part by “publiciz[ing] increased enforcement mechanisms that were to go into effect immediately after their amnesty periods.” Leonard and Zeckhauser [1987] identify four benefits and three costs of tax amnesties. The benefits are (1) reduction in the guilt of evaders (assuming that guilt is a dead-weight loss); (2) increase in revenue from voluntary tax payments; (3) addition of former delinquents to the tax rolls; and (4) smoothing the transition to a regime of stricter tax law enforcement. The costs are (1) increased feelings by honest taxpayers that the tax system is unfair; (2) encouragement of future noncompli-

3. Such an analysis is not only logically antecedent to the investigation of the consequences of running state tax amnesties, it is required of any such investigation. This is because a proper empirical analysis of the gross revenue due and attributable to state amnesties must account for the self-selection of states in choosing to initiate an amnesty program. An analysis of the fiscal consequences of state tax amnesties is presented in Dubin and Wilde [1990].

ance (due to the anticipation of future amnesties) and (3) reduction in the sense that tax evasion is wrong.<sup>4</sup>

These studies suggest that states have initiated tax amnesty programs to accomplish the dual goals of increasing revenues and decreasing noncompliance. In terms of specification of an empirical model, a desire for more revenue leads directly to the consideration of variables related to a state's fiscal "health" (e.g., state tax revenue), and to variables related to the potential yield from an amnesty (e.g., per capita income, unemployment, and, again, state tax revenue). The desire by states for decreased noncompliance merits some further discussion.

There is a direct linkage between the activities of state and federal tax agencies. Congress and state legislatures have explicitly provided for exchanges of otherwise confidential tax return and other tax information between the states and the IRS "to increase tax revenues and taxpayer compliance and reduce duplicate resource expenditures."<sup>5</sup> Agreements on the exchange of tax information also explicitly provide that state tax enforcement agencies and the IRS "will develop cooperative return selection and examination programs" to avoid duplicative efforts.<sup>6</sup> The IRS and cooperative states now routinely, for example, synchronize certain audit decisions.

Many states, however, rely almost exclusively on the IRS for enforcement of state income taxes [Snively, 1988; Dubin, Graetz, and Wilde, 1990a]. But IRS audit rates have fallen dramatically over the last decade from roughly 2 percent to under 1 percent [Dubin, Graetz, and Wilde, 1990a]. This decline has had significant effects on many state tax enforcement programs. In terms of model specification the fall in federal audit rates coupled with the reliance of states on information provided by the IRS suggests the consideration of variables related to the IRS's enforcement activities within a state—in particular, the IRS audit rate.

4. Alm and Beck [1986] analyze empirically the effects of various features of state tax amnesty programs on the direct revenue attributed to those programs, identifying the participation of known delinquents and greater funding for post-amnesty enforcement as the two key features. Leonard and Zeckhauser [1987] also consider the indirect consequences of tax amnesties in terms of the effects of such programs on revenue growth. However, while they find that states which had tax amnesties in 1983 and 1984 experienced greater revenue growth in subsequent years than states that did not, they do not control for any other factors besides the existence of an amnesty program.

5. Internal Revenue Service Manual, *Disclosure of Information Handbook*, §(33) 00.

6. *Id.* at Exhibit (33) 00-1, Section 5.1 (Draft Agreement on Coordination of Tax Administration).

## III. A DISCRETE-TIME DURATION MODEL

In this section we describe the econometric approach that is used to estimate the length of time states wait before initiating a tax amnesty. The econometric model we employ is a discrete-time duration model with normally distributed hazards.

In each period we classify the states according to their participation status: participating in a tax amnesty program or not yet participating. We specify the probability that a state which has not initiated an amnesty does initiate such a program conditional on its past experience, its economic characteristics, and other factors which may affect the attractiveness of amnesties.

Let  $y_{it}$  denote the participation status of state  $i$  in period  $t$ :

$$y_{it} = \begin{cases} 0 & \text{if not participating during period } t; \\ 1 & \text{if state initiates an amnesty during period } t. \end{cases}$$

The conditional probability that after  $t - 1$  periods of nonparticipation the state begins an amnesty program in period  $t$ , termed the "escape probability," is given by

$$\begin{aligned} P_{it} &= \Pr(y_{it} = 1 | y_{i1} = \dots = y_{i,t-1} = 0, x_{it}) \\ &= \Phi(\gamma'x_{it}), \end{aligned}$$

where  $x_{it}$  is a vector of characteristics thought to be related to the probability of initiating an amnesty and  $\Phi(\cdot)$  denotes the cumulative normal distribution function. The probability that a state which has not initiated an amnesty up to period  $t$  fails to initiate an amnesty in that period is  $1 - P_{it}$ .

For each state we calculate the number of years that have transpired without any amnesty program and denote this by  $T_i$ . The waiting time  $T_i$  takes on a maximum value of nine years in our data, and we record any state that has waited longer than nine years as a "censored" observation.

Let  $c_i$  denote the state's status after  $T_i - 1$  periods of nonparticipation:

$$c_i = \begin{cases} 0 & \text{if state has an amnesty} \\ 1 & \text{if state does not have an amnesty.} \end{cases}$$

Observations for which  $c_i = 1$  are censored, as the observed duration  $T_i$  does not represent a completed spell. The treatment of censoring is of some importance in the modeling of amnesty decisions as fourteen of the 40 states that have nontrivial state

income taxes did not initiate an amnesty in the nine years for which we have data.<sup>7</sup>

It follows that the conditional probability of observing a spell of length  $T_i$  which is either complete ( $c_i = 0$ ) or censored ( $c_i = 1$ ) is

$$(1) \quad L_i(T_i, c_i) = P_{i, T_i}^{1-c_i} (1 - P_{i, T_i})^{c_i} \prod_{t=1}^{T_i-1} (1 - P_{it}).$$

From (1) we form the log-likelihood for the full sample:  $L = \sum_{i=1}^N \log L_i(T_i, c_i)$ . Maximizing  $L$  with respect to the unknown parameter  $\gamma$  yields consistent and asymptotically normal estimates; optimization is undertaken using a Newton-Raphson algorithm with optimal step size.<sup>8</sup> Once the parameters have been estimated, it is straightforward to obtain an estimate of the expected amount of time states will spend without participating in amnesty programs and the cumulative probability of initiating an amnesty as a function of the duration of time without an amnesty program.

#### IV. SPECIFICATION AND ESTIMATION

We begin with the specification of the escape probability. The escape probability is assumed to be a function of the unemployment rate, personal income per capita, the percentage change in real income tax collections from the previous year and the rate of IRS auditing of individual tax returns. The unemployment rate and per capita income are related to both revenue and compliance, the percentage change in real income tax collection is related primarily to revenue, and the IRS audit rate is related primarily to compliance.

The potential relationship between the unemployment rate and state income tax amnesties is complex. First, states with higher unemployment rates may have unsound economies, and thus an amnesty in such a state would produce less revenue. Second, as indicated in Section II above, all amnesty programs include nonfilers, many exclusively so, and the number of nonfilers should increase as the unemployment rate rises. Third, if unemployment is associated with the so-called "underground economy"

7. We estimate our model for the years 1980–1988. North Carolina, in fact, ran a tax amnesty in 1989, and Virginia ran a tax amnesty in 1990, but we have not used this information since we lack the information on the necessary socioeconomic factors for 1989 and 1990.

8. Estimation is performed within the Statistical Software Tools econometric package. See Dubin and Rivers [1988].



generally, then states with higher unemployment rates should have greater noncompliance problems. On net, since the presence of per capita income in our model should mitigate the first effect to some extent, we expect a positive relationship between the unemployment rate and the likelihood of an amnesty.

Per capita income potentially has a complex relationship with state income tax amnesties because of (1) direct yield and fiscal stress effects (revenue-based motives for amnesties), (2) filing effects (taxpayers' minimum requirements for filing), and (3) compliance effects (increased opportunities to evade). All of these factors except the fiscal stress effect suggest a positive relationship between per capita income and the likelihood of an amnesty.

The percentage change in state income tax collections provides an ideal test of the yield hypothesis versus the fiscal stress hypothesis; i.e., between the hypothesis that states with a solid revenue base are more likely to have an amnesty and the hypothesis that states experiencing fiscal stress are more likely to have an amnesty. A positive relationship between the percentage change in state income tax collections and the likelihood of an amnesty supports the yield hypothesis, while a negative relationship supports the fiscal stress hypothesis.

Finally, we include the federal audit rate of individual returns. On the one hand, states with higher federal audit rates might have compliance problems that are known to the IRS. This perception could lead a state to initiate its own amnesty program to combat the noncompliance. On the other hand, states where auditing is high benefit from the presence of the federal government with respect to their attempts to enforce tax compliance. Such states may view federal enforcement efforts as a cheap alternative to their own enforcement efforts and may thus eschew amnesty programs on the grounds that they are both costly and unnecessary.

The role of audits raises special estimation issues. An unobserved effect such as greater noncompliance in a state may increase or decrease the state's propensity to initiate an amnesty program. Concurrently, greater noncompliance is likely to cause the IRS to increase its audit rate. To determine which effect (free-riding or directly combating noncompliance) dominates a state's decision to initiate an amnesty program requires that the simultaneous determination of audit rates and durations be explicitly recognized in the econometric analysis. In this regard, let

$$(2) \quad y_{lit}^* = y_{2it}'\delta_1 + x_{lit}'\beta_1 + \mu_{lit}$$

denote the latent variable for the escape event (initiate an amnesty) in period  $t$  for state  $i$ . This unobserved measure is a function of state-specific exogenous characteristics ( $x_{1it}$ ) and the potentially endogenous audit level ( $y_{2it}$ ). As discussed above, we observe the discrete outcome  $y_{1it}$ .

The audit rate is specified by a reduced form,

$$(3) \quad y'_{2it} = x'_{2it} \prod_2 + v'_{2it},$$

where  $x_{2it}$  is a vector of state and time-varying characteristics that affect the level of auditing. The econometric difficulty is that the probit specification for the conditional escape probability resulting from equations (2) and (3) contains the potentially endogenous regressor  $y'_{2it}$ .

While several solutions to this problem have been proposed (see Rivers and Vuong [1988] for a summary), we use the two-stage instrumental variables method (2SIV) due to Nelson and Olsen [1978]. Consistent estimates of the parameters  $\delta_1$  and  $\beta_1$  in the structural equation are obtained by replacing  $y'_{2it}$  by its reduced-form predicted value  $y'_{2it} = x'_{2it} \hat{\Pi}_2$ . The probit escape probability is therefore specified as

$$(4) \quad P_{it} = \Phi(y'_{2it} \delta_1 + x'_{1it} \beta_1).$$

As demonstrated by Newey [1987], the 2SIV procedures does not, in general, attain the Cramer-Rao lower bound that is achievable using limited information maximum likelihood methods, but it has the advantage of computational simplicity. To test for the endogeneity of  $y'_{2it}$  in the structural model, we calculate the asymptotic  $t$ -statistic for the coefficient of the reduced-form residual when it is added as an additional explanatory variable to equation (4) [Smith and Blundell, 1986].

The reduced-form estimates for the audit equation are adapted from Dubin, Graetz, and Wilde [1990b]. In the present analysis we specify the individual audit rate to be a function of the exogenous variables from the duration model—the unemployment rate (UR), per capita income (INCOME), and the percentage change in real state tax revenue (PSTAX)—and three instrumental variables—IRS budgets per return filed (BPR), the number of non-W-2 information returns filed per return (INFRATE), and the percent of the adult population over 65 years old (PER65). We estimate the

TABLE II  
VARIABLE DEFINITIONS AND SOURCES

CONSTANT	Constant term
UR	Unemployment rate <sup>a</sup>
INCOME	Personal income per capita in constant (1972) dollars <sup>a</sup>
PSTAX	Percentage change in real state income tax collections <sup>b</sup>
AUDIT	Individual Audit Rate—number of individual returns examined divided by the number of individual returns filed <sup>c</sup>
BPR	Budget per return—IRS state level budget divided by the total number of returns filed <sup>c</sup>
INFRATE	Number of non-W-2 information returns program documents divided by the number of returns filed <sup>d</sup>
PER65	Percentage of the adult population over 65 years of age <sup>a</sup>

a. The unemployment rate, personal income, and the percentage of the adult population over 65 years of age are taken from the *Bureau of Economic Analysis* as reported in the *Statistical Abstract of the U. S.*, 1981–1989.

b. Total state income taxes are taken from *State Government Tax Collections*, 1980–1988, published by the U. S. Department of Commerce. We divide this variable by total state income, taken from *Statistical Abstracts of the U. S.*, 1981–1989, to obtain the average state income tax rate.

c. Individual returns filed, individual returns examined, IRS state-level budgets, and total returns filed are taken from *Annual Report of the Commissioner of Internal Revenue*, 1980–1988. The audit rate excludes some audits conducted at the IRS Regional Service Centers amounting to approximately 1 to 2 percent of all individual examinations.

d. Number of information returns were obtained directly from the Internal Revenue service for the years 1977–1988.

reduced form using GLS since we assume that the error term in the reduced-form equation contains a state-specific random effect.<sup>9</sup>

The definitions and sources of the variables used in the reduced form as well as the duration model are given in Table II. We provide mean values of the variables for each of the nine years (1980–1988) for which we have data in Table III. Table III is based on a subset of the 40 states that have some significant state income tax program (as are the estimated duration models).

## V. RESULTS

The duration models are based on 360 observations (40 states over nine years). We have calculated the length of time each state waits before it initiates an amnesty, and we record this length on both a fiscal and calendar year basis. Our working assumption is that durations are measured relative to 1980. We use 1980 as a

9. We omit presentation or discussion of the estimated reduced form specifically because it lacks a structural interpretation. We did perform Hausman-type specification tests using alternative reduced forms including that used by in Dubin, Graetz, and Wilde [1990b]. The estimated duration model and our conclusions regarding the endogeneity of the audit rate are generally robust to these alternative specifications.

TABLE III  
MEAN VALUES FOR VARIABLES IN REDUCED-FORM AUDIT EQUATION AND FOR  
VARIABLES IN DURATION MODEL<sup>a</sup>

Variable <sup>b</sup>	1980	1981	1982	1983	1984	1985	1986	1987	1988
UR	0.074	0.074	0.094	0.095	0.074	0.072	0.070	0.062	0.062
INCOME	5.03	5.13	5.07	5.15	5.42	5.39	5.59	5.61	5.33
PSTAX	-0.0070	0.033	0.018	0.067	0.230	0.054	0.022	-0.044	-0.040
AUDIT	1.59	1.48	1.34	1.29	1.15	1.09	0.92	0.84	0.78
BPR	0.0042	0.0040	0.0040	0.0043	0.0043	0.0042	0.0040	0.0042	0.0046
INFRATE	3.62	3.96	4.18	4.38	4.91	5.62	5.51	5.45	5.24
PER65	0.156	0.157	0.159	0.160	0.162	0.164	0.165	0.167	0.167

a. Based on a subset of 40 states that have a significant state tax program. States excluded are Alaska, Connecticut, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming.

b. UR and PER65 are percentages expressed in decimal form (i.e., 0.67 is 67 percent). PSTAX and AUDIT are percentages. INCOME and BPR are in thousands of 1972 dollars.

starting point since the first state in our sample to conduct a tax amnesty was Illinois and this amnesty occurred in calendar year 1981. We record this as a one-year duration event.<sup>10</sup>

The estimated duration models are presented in Table IV. The results are given for four models. The first two are based on calendar year lengths, and the second two are based on fiscal year lengths. Within each set we estimate first the model without correction for endogeneity of audits and second the endogeneity-corrected model.

The audit rate effect is not significant in the models that are unadjusted for endogeneity (models 1 and 3). Since Hausman tests for endogeneity of the federal audit rate in models 1 and 3 yielded asymptotic *t* values of 1.92 and 1.11, respectively, we use the 2SIV procedures to correct for endogeneity. The consistent audit rate effect is then seen to be negative and significant (models 2 and 4). An increase in the audit rate leads states to wait longer before initiating a tax amnesty (the escape rate in any period declines) and thus the hypothesis of states free-riding is accepted—or at least dominates the behavior of the states vis-à-vis their own intentions regarding noncompliance.

Given that the log-likelihoods in models 2 and 4 are similar, we do not discern any significant differences arising from the two methods of measuring the length of time elapsed before a state

10. Both Illinois and Louisiana have each had two amnesties. Our duration model is based on the first amnesty for each state. We define the fiscal year to be October 1 to September 30, following the current federal practice.

TABLE IV  
DURATION MODEL FOR TIME WAITED BEFORE INITIATING AN AMNESTY<sup>a</sup>

Variable	Calendar year duration			Fiscal year duration
	Model 1	Model 2 <sup>b</sup>	Model 3	Model 4 <sup>b</sup>
CONSTANT	-3.52 (-3.08)	-2.31 (-1.80)	-3.289 (-2.87)	-2.58 (-2.00)
UR	9.23 (1.93)	10.50 (2.14)	9.09 (1.88)	9.83 (1.99)
INCOME	0.317 (1.96)	0.176 (0.998)	0.333 (2.06)	0.210 (1.20)
PSTAX	0.964 (1.82)	1.092 (2.04)	0.832 (1.87)	0.924 (2.03)
AUDIT	-0.179 (-0.62)	-0.677 (-2.00)	-0.46 (-1.48)	-0.564 (-1.67)
Log-likelihood	-77.815	-75.960	-78.189	-77.956

a. Based on a subset of 40 states that have a significant state tax program. States excluded are Alaska, Connecticut, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming. *t*-statistics are in parentheses.  
b. Estimated using the (2SIV) method. The reduced form for the audit rate includes UR, INCOME, PSTAX, and the instrumental variables PER65, BPR, and INFRATE. See Dubin, Graetz, and Wilde [1990b] for details concerning specification and estimation of the reduced form.

initiates an amnesty. In the discussion that follows, we use the calendar-based specification given in model 2 since it has the larger log-likelihood.

The estimated effects in model 2 are generally in accord with our expectations. An increase in unemployment increases the likelihood of an amnesty as does an increase in per capita income (although the latter effect is not significant using the 2SIV estimates). The fiscal stress variable, PSTAX, which measures the percentage change in state tax revenue, has a coefficient that is significant and positive; states for which real state tax collections are increasing are more likely to initiate amnesties, thus supporting the yield hypothesis as opposed to the fiscal stress hypothesis.<sup>11</sup>

11. As noted above, Leonard and Zeckhauser [1987] find some evidence that states which had amnesties in 1984 and 1985 experienced greater increases in revenue growth in subsequent years than states that did not. Leonard and Zeckhauser also observe that states which conducted amnesties in 1984 and 1985 had lower growth rates in state revenue from 1980–1983 than states that did not. This latter observation seemingly is supportive of the fiscal stress hypothesis. Using the growth in real state income tax revenues, we found the same pattern as did Leonard and Zeckhauser. However, this pattern fails to hold for later amnesties. In fact, estimating the duration model over 1980–1988 using only PSTAX as an explanatory variable, provides weak evidence for the yield hypothesis and no evidence for the fiscal stress hypothesis.

Finally, we can illustrate the important role of audits in contributing to the states' rate of adoption of amnesty programs. We use the estimated duration model to calculate the cumulative adoption probabilities under an assumed course of events in which the IRS had not lowered the audit rate from its 1980 to 1988 levels. Using the 1980 levels of the audit rate shows that states would not have adopted amnesty programs with anywhere near the fervor we have witnessed. By the end of the sample period (1988), the cumulative adoption percentage would only be about 44 percent as compared with the actual value of approximately 60 percent. It would therefore appear that a side effect of the federal policy of diminished audit capability resulted in shifting a substantial enforcement burden onto the states, which then found it necessary to substitute their own efforts in place of the federal governments.

## VI. CONCLUSION

While state tax amnesties may have resulted in increased rates of revenue growth for those states that ran them [Leonard and Zeckhauser, 1987], it is hard to escape the conclusion that many states initiated tax amnesties as part of a systematic effort to respond to the decade-long fall in federal tax enforcement activities. Many, but not all, states coupled tax amnesties with increased post-amnesty enforcement efforts of their own. At the same time, there is no evidence that states that ran amnesty programs were under any "fiscal stress." Indeed, states with high per capita income and high growth rates in real state income tax collections were most likely to run tax amnesties, perhaps because an amnesty in such states was expected to generate higher yield.

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